

TA-515


*AEP Model
E Model
UK Model
Canadian Model*




INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

SAFETY RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

GENERAL

System:	Direct output coupling, pure-complementary symmetry power amplifier circuit (SEPP OTL)
Power Requirements:	120 V ac, 60 Hz (Canadian model) 220 V ac (or 120 or 240 V ac adjustable by Sony personnel), 50 Hz (AEP model) 240 V ac, 50 Hz (UK model) 120, 220, or 240 V ac adjustable, 50/60 Hz (E model)
Power Consumption:	125 W (Canadian model) 250 W (AEP, E model) 325 W (UK model)
AC Outlets:	1 switched, 100 W 2 unswitched, total 200 W } (Canadian model)
Dimensions:	Approx. 410 (w) x 145 (h) x 280 (d) mm 16 1/8 (w) x 5 3/4 (h) x 11 1/8 (d) inches Including projecting parts and controls
Weight:	Approx. 7.1 kg, 15 lb 10 oz (net) Approx. 7.9 kg, 17 lb 7 oz (in shipping carton)

— Continued on page 2 —

SONY

SERVICE MANUAL

AMPLIFIER SECTION

Continuous RMS Power Output:
(Less than 0.3% (8 Ω)
or 0.7% (4 Ω) THD,
both channels driven
simultaneously)

At 1 kHz
43 W + 43 W (8 Ω or 4 Ω)
At 20 Hz—20 kHz
40 W + 40 W (8 Ω or 4 Ω)
According to DIN 45500
40 W + 40 W (8 Ω or 4 Ω)

Power Bandwidth: 10 Hz — 40 kHz (8 Ω), 1HF

Damping Factor: 30 (8 Ω, 1 kHz)

Frequency Response:

PHONO	RIAA equalization curve ± 0.3 dB
MIC	100 Hz — 10 kHz $+0$ -3 dB
TUNER AUX TAPE 1 TAPE 2	10 Hz — 50 kHz $+0$ -3 dB

Harmonic Distortion: Less than 0.3% at rated output (8 Ω)
Less than 0.7% at rated output (4 Ω)
Less than 0.2% at 1 W output

IM Distortion: Less than 0.5% at rated output
(60 Hz : 7 kHz = 4 : 1)
Less than 0.2% 1 W output

Tone Controls: BASS ± 9 dB at 100 Hz
TREBLE ± 9 dB at 10 kHz

Loudness: +9 dB at 100 Hz
(att. 30 dB) +4 dB at 10 kHz

Inputs:

	Sensitivity	Impedance	Maximum Input Capability (at 1 kHz, 0.5 % distortion)	S/N (weighting network, input level)
PHONO	2.5 mV (−50 dB)	50 kΩ	240 mV	80 dB (A, 2.5 mV)
MIC	2 mV (−51.7 dB)	10 kΩ	—	—
TUNER AUX TAPE 1 TAPE 2	150 mV (−14.5 dB)	50 kΩ	—	95 dB (A, 150 mV)

Outputs:

REC OUT 1, 2	Voltage 150 mV (−14.5 dB), Impedance 10 kΩ
HEADPHONES	Accepts low and high impedance headphones
SPEAKER	Accepts speakers of 8 — 16 Ω (Canadian model) or 4 — 16 Ω (AEP, UK, E model)

0 dB = 0.775 V

MODEL IDENTIFICATIONS

— Specification Labels —

AEP model

SONY.	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-515 AC 220 V ~ 50 Hz 250 W MADE IN JAPAN
	SERIAL NO.

Canadian model

SONY.	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-515 AC 120 V 60 Hz 125 W MADE IN JAPAN
	SERIAL NO.

UK model

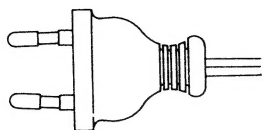
SONY. DAIGEN	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-515 AC 240 V ~ 50 Hz 325 W MADE IN JAPAN
	SERIAL NO.

E model

SONY. DAIGEN	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-515 AC 120, 220, 240 V ~ 50/60 Hz 250 W MADE IN JAPAN
	SERIAL NO.

— Power Cord —

E1 model: euro-plug
(1-551-530-00)



E2 model: parallel-blade plug
(1-534-487-XX)



IC201, 251 (CX171) HANDLING PRECAUTIONS

IC201, 251 (CX171) used for this unit are not MOS ICs, but it is necessary to handle them as same as MOS IC. Proceed the following steps when replacing them.

1. Maintain all the pins at the same potential by wrapping the IC in aluminum foil or other similar material (See Fig. 1).

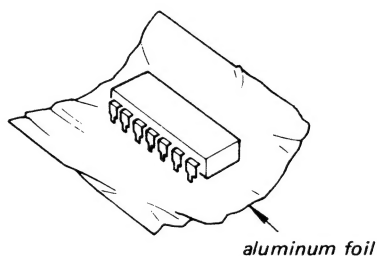


Fig. 1

2. Ground the work bench for static electricity (See Fig. 2) (Place a sheet of aluminum onto the bench.)

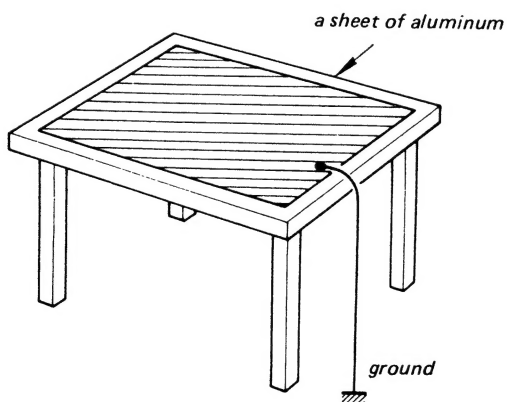


Fig. 2

3. If necessary to touch the IC direct, grasp the IC at a point other than the pins. Moreover, wear cotton gloves or a cotton finger sack. (Gloves made of nylon or other similar material are undesirable. The static electricity on your body can be easily discharged by wrapping a ground wire around your wrist.)

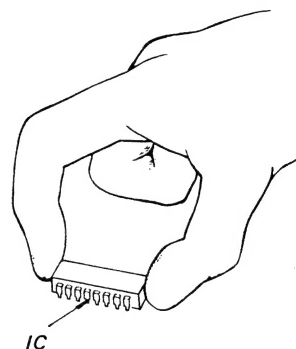


Fig. 3

4. Short all the pins of the IC before beginning any work. Also ground the soldering iron.

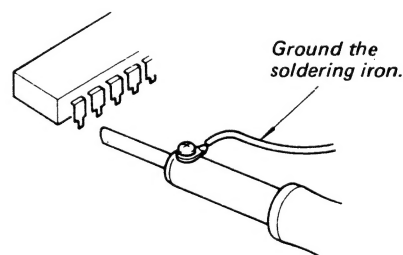


Fig. 4

5. After soldering the IC, apply a suitable adhesive to insulate terminals ① to ④ of the IC.

the equivalent of the CEMEDINE No. 240
(Part No. 7-432-201-42)

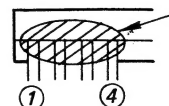
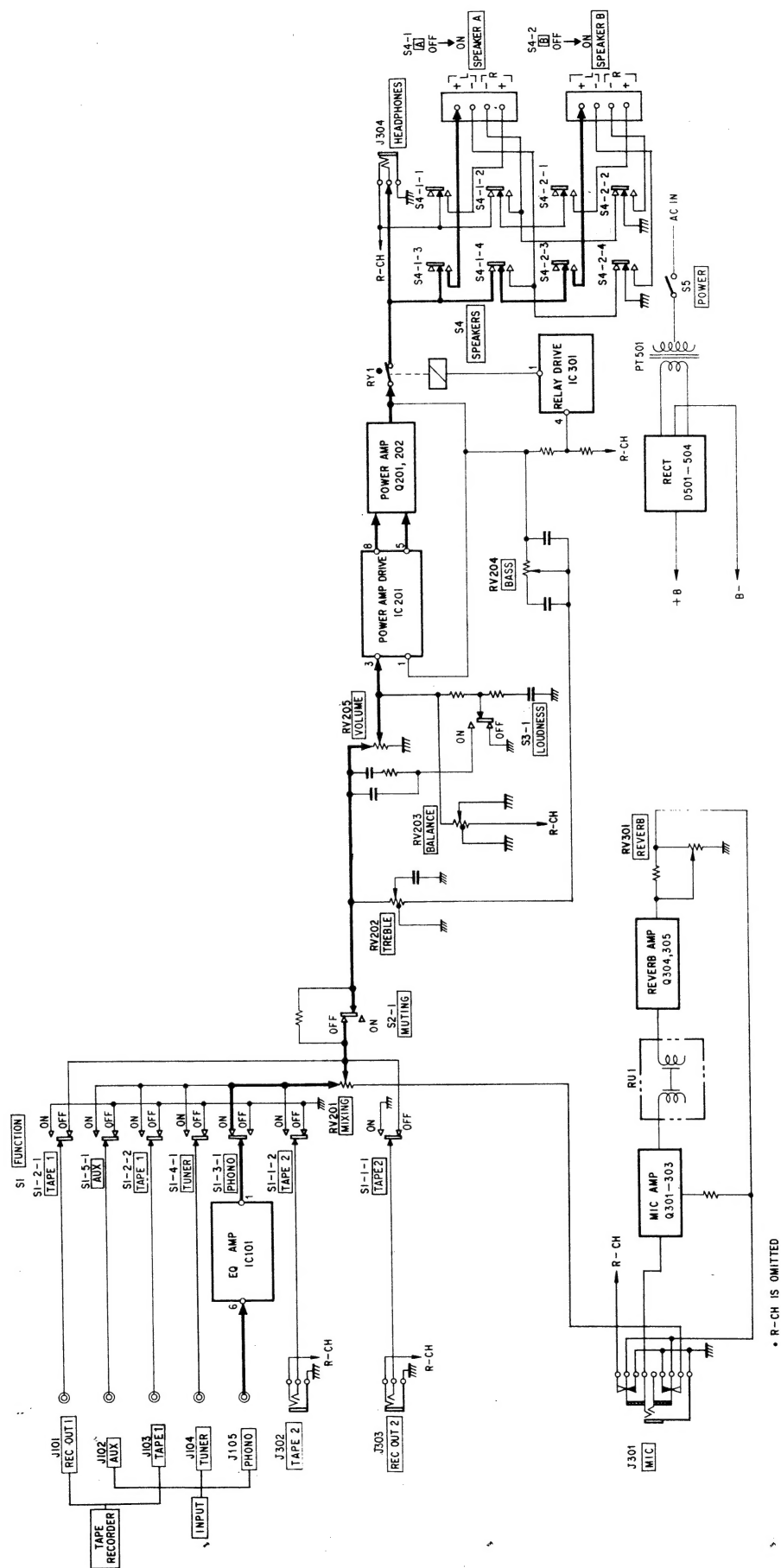


Fig. 5

SECTION 1

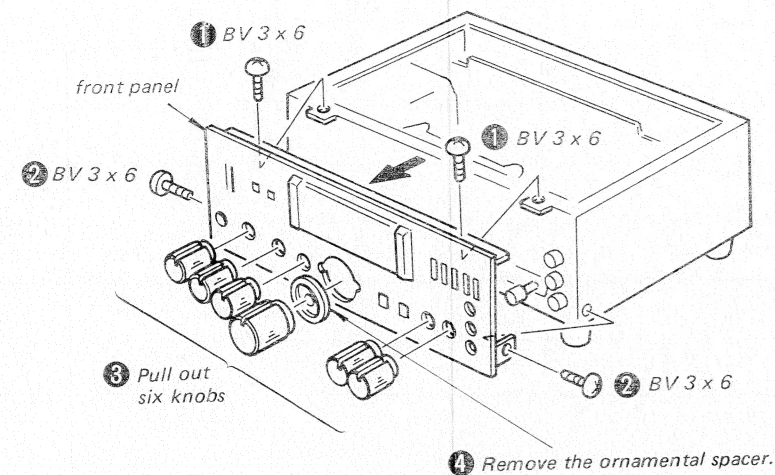
BLOCK DIAGRAM



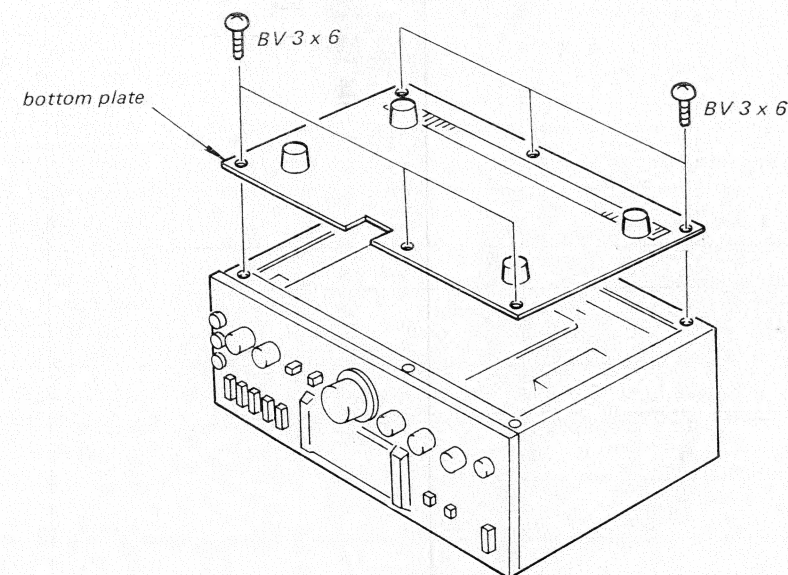
SECTION 2 DISASSEMBLY

2-1. FRONT PANEL REMOVAL

Note: Follow the disassembly procedure in the numerical order given.



2-2. BOTTOM PLATE REMOVAL



SECTION 3 ADJUSTMENTS

3-1. IDLING CURRENT ADJUSTMENT

Setting:

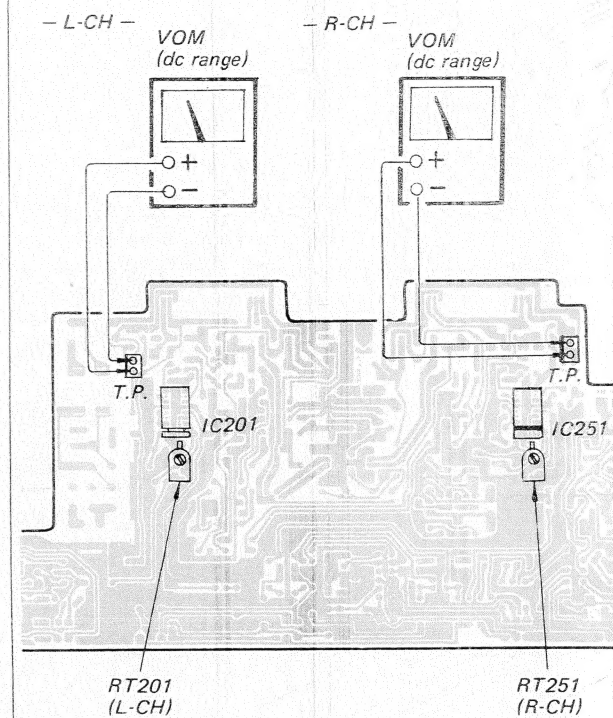
VOLUME control: minimum

Procedure:

Adjust RT201 (L-CH) and RT251 (R-CH) for 11 mV reading on the VOM.

Adjustment Location:

— power amp board —

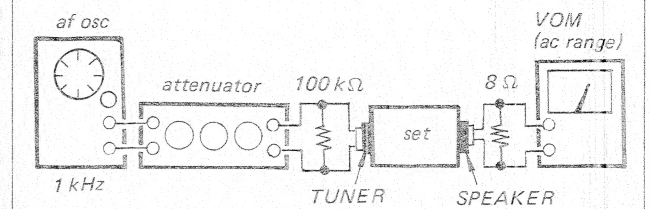


3-2. METER LEVEL ADJUSTMENT

Setting:

FUNCTION switch: TUNER

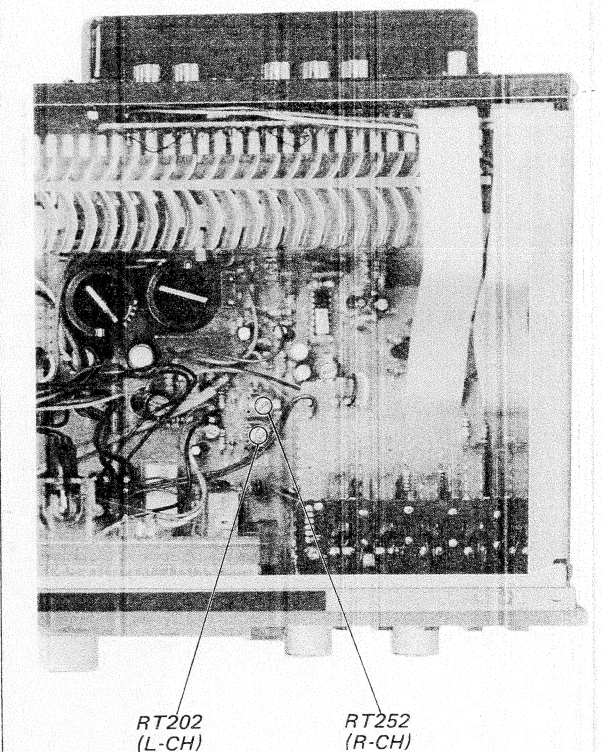
Procedure:



1. Turn the VOLUME control for a 2.83 V (1 W) reading on VOM.
2. Adjust RT202 (L-CH) and RT252 (R-CH) so that the power meter indicates 1 W.

Adjustment Location:

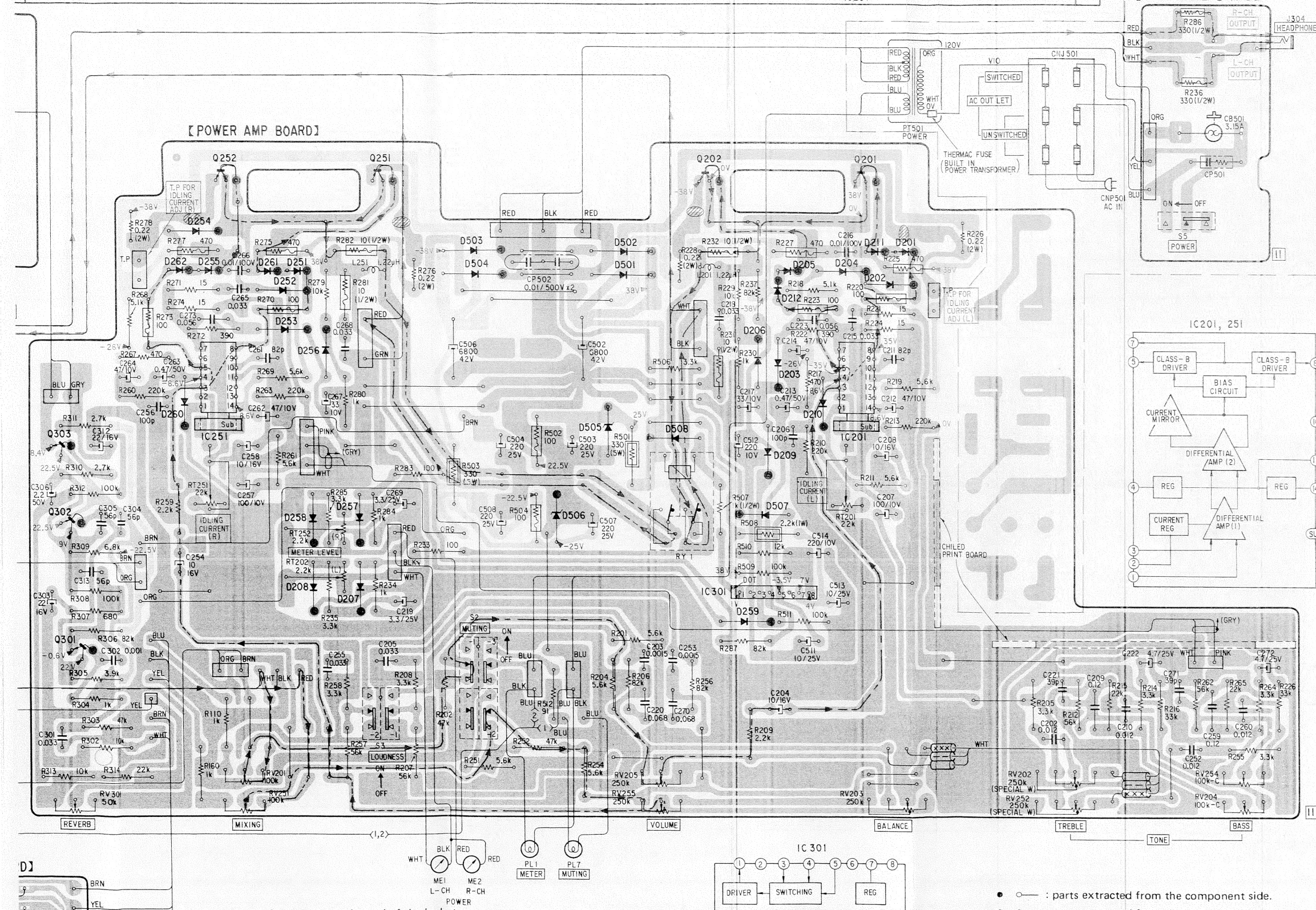
— power amp board —



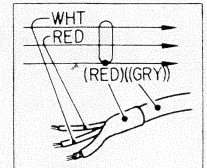
MEMO

[illegible]

	254	255	251	256	257	503	502	206	212	205	204	211	201	
	262	260	252	253	208	504	506	259	209	203	210	202	202	D
IC	303	302	252											Q, IC
	301	IC251						IC301	IC201					

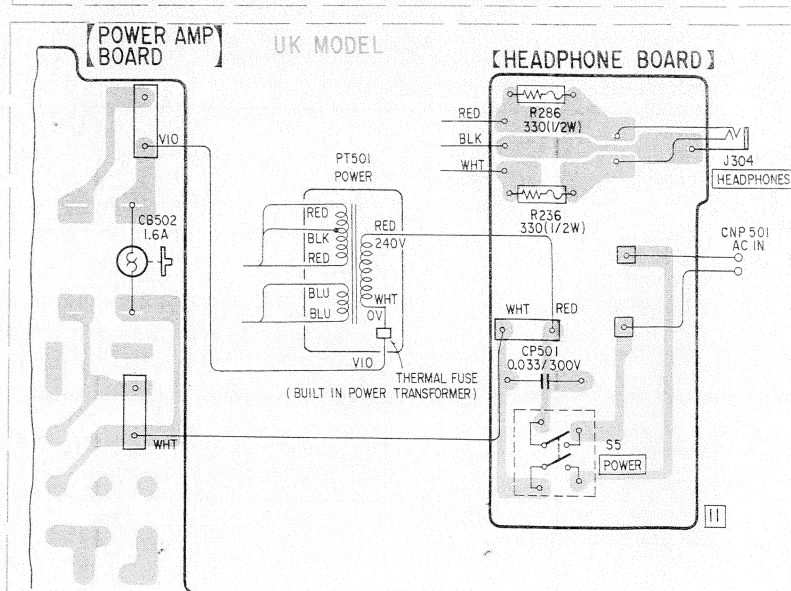
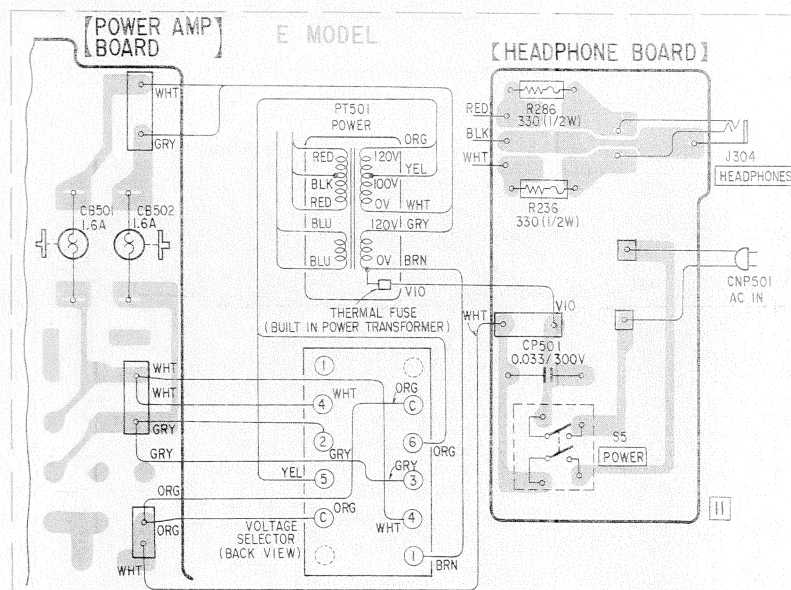
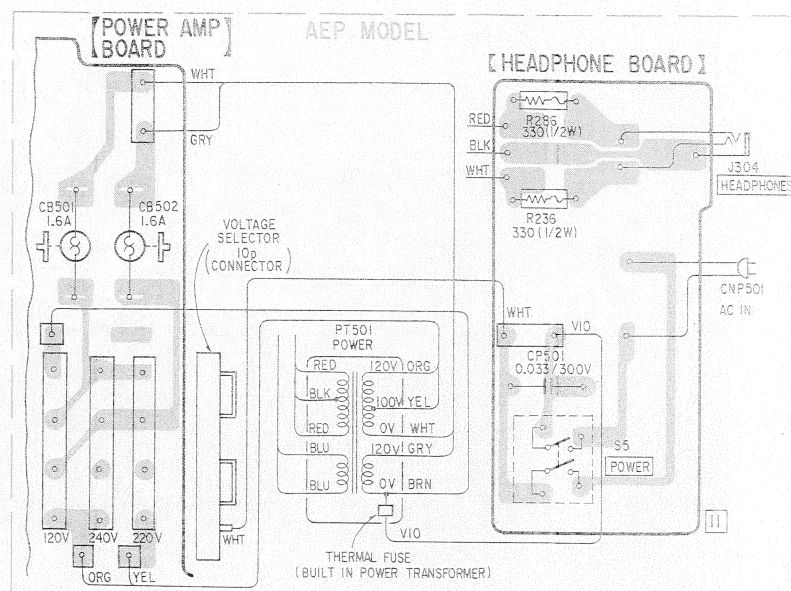
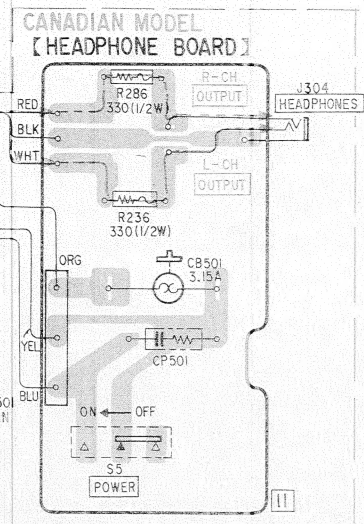


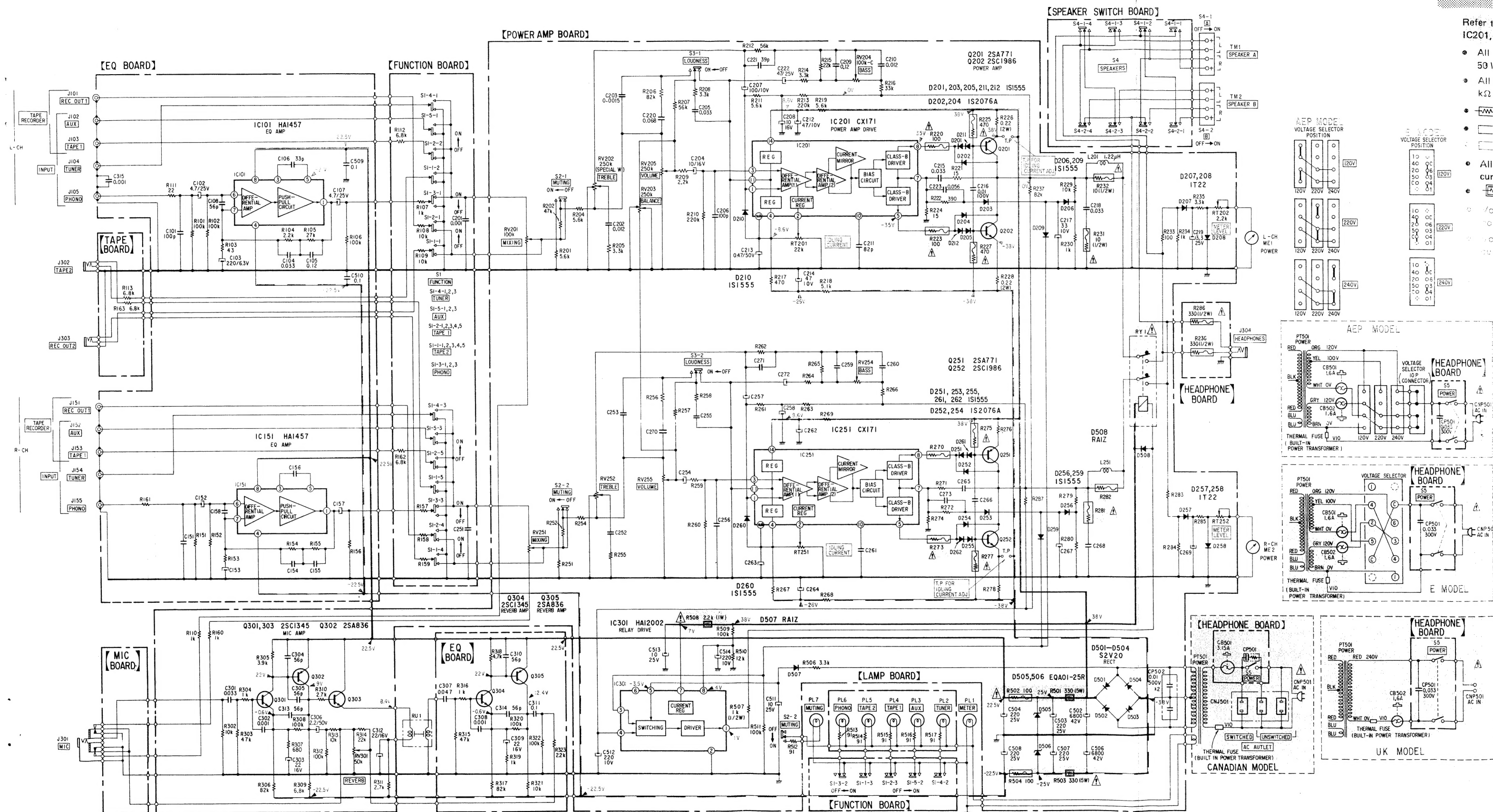
Color code of sleeving over the end of the jacket.





Refer the precautions on page 3 surely when handling IC201, 251 (CX171) for safety.

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : part mounted on the conductor side.
- : B + pattern
- : B - pattern
- : Signal Path
- : L-CH
- : R-CH
- : Common









Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.


Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Refer the precautions on page 3 surely when handling IC201, 251 (CX171) for safety.

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F}$ 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\frac{1}{4}\text{W}$ unless otherwise noted. $\text{k}\Omega = 1000\Omega$; $\text{M}\Omega = 1000\text{k}\Omega$
-  : fusible resistor.
-  : panel designation.
-  : adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : nonflammable resistor.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.

• Readings are taken under no-signal condition, with a VOM (20 k Ω/V).

•  : B+ bus.

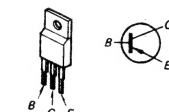
•  : E- bus.

• Switch

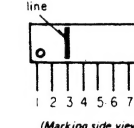
Ref. No.	Switch	Position
S1-1	TAPE 2	OFF
S1-2	TAPE 1	OFF
S1-3	PHONO	ON
S1-4	TUNER	OFF
S1-5	AUX	OFF
S2	MUTING	OFF
S3	LOUDNESS	OFF
S4-1	SPEAKER A	OFF
S4-2	SPEAKER B	OFF
S5	POWER	OFF

- Replacement Semiconductors
For replacement, use semiconductors except in ().

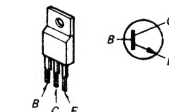
Q201, 251: 2SA771



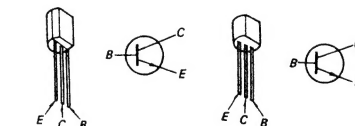
IC301: HA12002



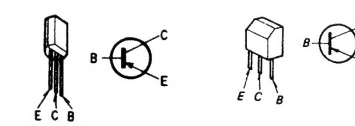
Q202, 252: 2SC1986C (2SC1986)



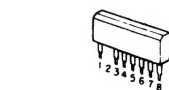
Q301, 303: 2SC1362 (2SC1345)
Q304



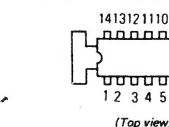
Q302, 305: 2SA872D (2SA836)



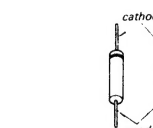
IC101, 151: HA1457



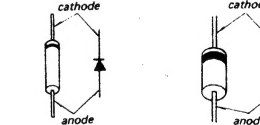
IC201, 251: CX171



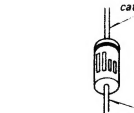
D201, 251
D203, 253
D205, 255
D206, 256
D209, 259
D210, 260
D211, 261
D212, 262
D202, 252
D204, 254
D207, 257
D208, 258



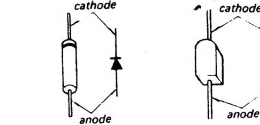
D501-504: 10E2 (S2V20)



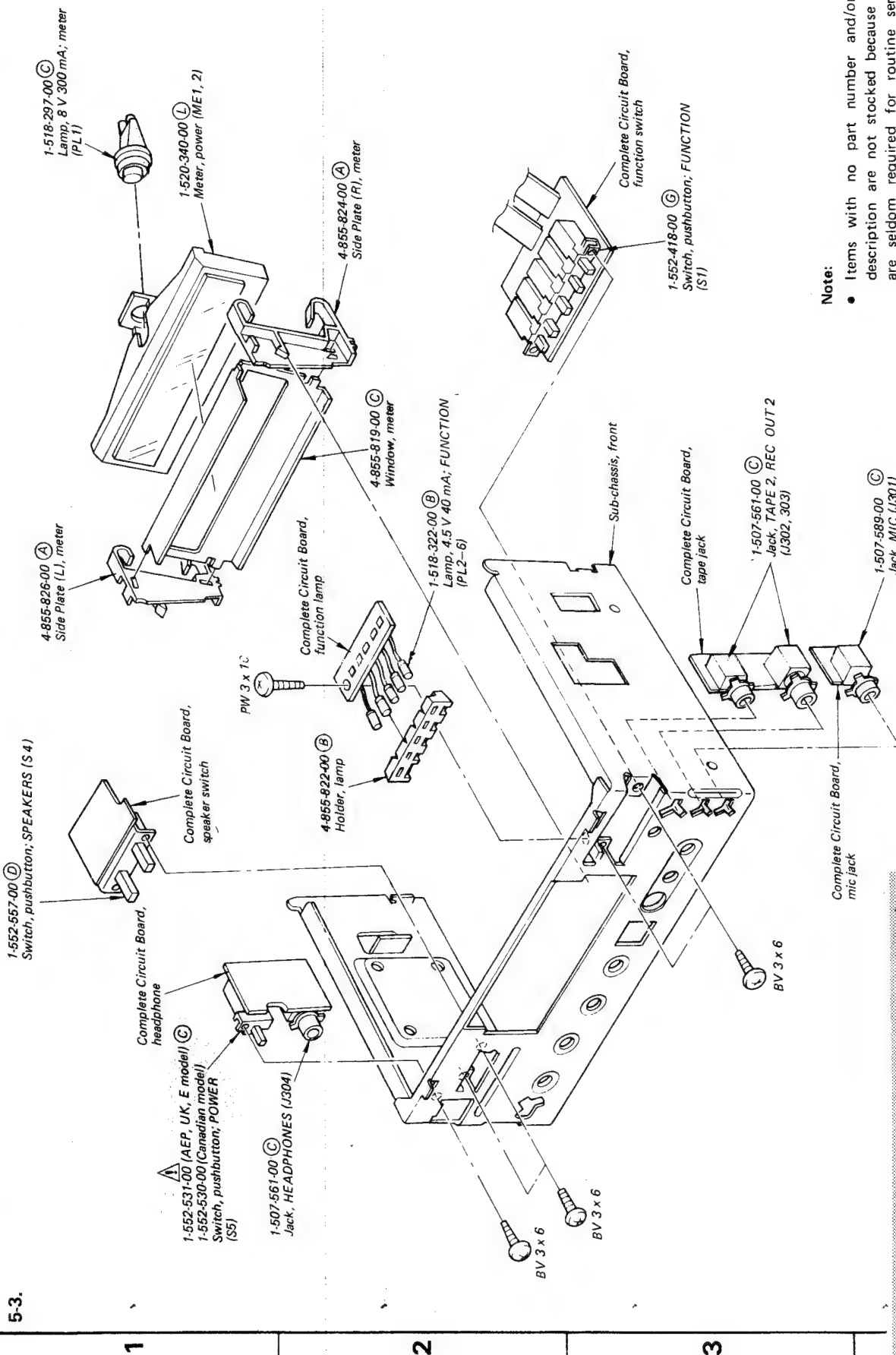
D505, 506: EQA01-25 (EQA01-25R)



D507, 508: 10E2 (RA12)



5-3.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
(—) = slotted head
- Circled letters (A) to (Z) are applicable to European models only.

Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 6

ELECTRICAL PARTS LIST

Note: Circled letters (A to Z) are applicable to European models only.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			
SEMICONDUCTORS					
Transistors					
Q201, 251	8-729-377-12	(E) 2SA771			
⇒ Q202, 252	8-729-308-62	(E) 2SC1986C			
⇒ Q301	8-729-655-47	(B) 2SC1362			
⇒ Q302	8-729-387-27	(B) 2SA872D			
⇒ Q303, 304	8-729-665-47	(B) 2SC1362			
⇒ Q305	8-729-387-27	(B) 2SA872D			
ICs					
IC101, 151	8-759-314-57	(C) HA1457			
IC201, 251	8-751-710-00	(G) CX171			
IC301	8-759-320-02	(O) HA12002			
Diodes					
D201, 251	8-719-815-55	(B) 1S1555			
D202, 252	8-719-923-76	(B) 1S2076A			
D203, 253	8-719-815-55	(B) 1S1555			
D204, 254	8-719-923-76	(B) 1S2076A			
D205, 255	8-719-815-55	(B) 1S1555			
D206, 256					
⇒ D207, 257	8-719-422-21	(B) 1T22AM			
⇒ D208, 258					
D209-212					
D259-262					
⇒ D501-504	8-719-200-02	(B) 10E2			
⇒ D505, 506	8-719-931-25	(B) EQB01-25			
⇒ D507, 508	8-719-200-02	(B) 10E2			
CAPACITORS					
All capacitors are in μ F and ceramic unless otherwise noted. 50 WV or less are not indicated except for electrolytics. pF = μ F, elect = electrolytic					
C101, 151	1-102-973-11	(A) 100p			
C102, 152	1-121-915-11	(B) 4.7	25 V	elect	
C103, 153	1-121-419-11	(B) 220	6.3 V	elect	
C104, 154	1-108-244-12	(A) 0.033		mylar	
C105, 515	1-108-363-12	(A) 0.12		mylar	
C106, 156	1-102-963-11	(A) 33 p			
C107, 157	1-121-915-11	(B) 4.7	25 V	elect	
C108, 158	1-101-884-11	(A) 56 p			
C201, 251	1-101-001-11	(A) 0.001			
C202, 252	1-108-357-12	(A) 0.012		mylar	
C203, 253	1-108-228-12	(A) 0.0015		mylar	
C204, 254	1-123-288-11	(B) 10	16 V	elect	
C205, 255	1-108-244-12	(A) 0.033		mylar	
C206, 256	1-102-973-11	(A) 100 p			
C207, 257	1-121-414-11	(A) 100	10 V	elect	
C208, 258	1-123-288-11	(B) 10	16 V	elect	
C209, 259	1-108-363-12	(A) 0.12		mylar	
C210, 260	1-108-357-12	(A) 0.012		mylar	
C211, 261	1-102-971-11	(A) 82 p			
C212, 262	1-121-352-11	(A) 47	10	elect	
C213, 263	1-121-726-11	(A) 0.47	50	elect	
C214, 264	1-121-352-11	(A) 47	10	elect	
C215, 265	1-108-244-12	(A) 0.033		mylar	
C216, 266	1-108-377-12	(A) 0.01	100 V	mylar	
C217, 267	1-121-403-11	(A) 33	10 V	elect	
C218, 268	1-108-244-12	(A) 0.033		mylar	
C219, 269	1-121-392-11	(A) 3.3	25 V	elect	
C220, 270	1-108-249-12	(A) 0.068		mylar	
C221, 271	1-102-965-11	(A) 39 p			
C222, 272	1-121-395-11	(A) 4.7	25 V	elect	
C223, 273	1-108-361-12	(A) 0.056		mylar	
C301	1-108-244-12	(A) 0.033		mylar	
C302	1-101-001-11	(A) 0.001			
C303	1-123-191-11	(A) 22	16 V	elect	
C304, 305	1-101-884-11	(A) 56 p			
C306	1-121-450-11	(A) 2.2	50 V	elect	
C307	1-108-246-12	(A) 0.047		mylar	
C308	1-101-001-11	(A) 0.001			
C309	1-123-191-11	(A) 22	16 V	elect	
C310	1-101-884-11	(A) 56 p			
C311	1-108-251-11	(B) 0.1		mylar	

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No.	Part No.	Description
C312	1-123-191-11 (A) 22	16 V elect
C313, 314	1-101-884-11 (A) 56 p	
C315	1-101-001-11 (A) 0.001	
C502	1-125-157-11 (A) 6800	42 V elect
C503, 504	1-121-422-11 (B) 220	25 V elect
C506	1-125-157-11 (A) 6800	42 V elect
C507, 508	1-121-422-11 (B) 220	25 V elect
C509, 510	1-108-251-12 (A) 0.1	mylar
C511	1-121-398-11 (A) 10	25 V elect
C512	1-121-420-11 (A) 220	10 V elect
C513	1-121-398-11 (A) 10	25 V elect
C514	1-121-420-11 (A) 220	10 V elect


RESISTORS

All resistors are in ohms. Common 1/4W carbon resistors are omitted. Refer to the list on the last page for their part numbers. k Ω : 1000 Ω .

R220, 270	1-121-881-11 (A) 100	1/4 W fusible
R223, 273		
R225, 275	1-212-897-11 (A) 470	1/4 W fusible
R226, 276	1-217-151-11 (A) 0.22	2 W wirewound
R227, 277	1-212-897-11 (A) 470	1/4 W fusible
R228, 278	1-217-151-11 (A) 0.22	2 W wirewound
R231, 232	1-212-958-11 (A) 10	1/2 W fusible
R281, 282		
R236, 286	1-212-994-11 (A) 330	1/2 W fusible
R501	1-207-689-11 (B) 330	5 W wirewound (nonflammable)
R502	1-212-881-11 (A) 100	1/4 W fusible
R503	1-207-689-11 (B) 330	5 W wirewound (nonflammable)
R504	1-212-881-11 (A) 100	1/4 W fusible
R507	1-244-873-11 (A) 1 k	1/2 W carbon
R508	1-213-147-11 (B) 2.2 k	1 W metal oxide (nonflammable)



All variable and adjustable resistors have characteristic curve B, unless otherwise noted. k Ω : 1000 Ω , M Ω : 1000 k Ω

RT201, 251	1-224-646-XX (B) 22 k, adjustable; idling current
RT202, 252	1-224-643-XX (B) 2.2 k, adjustable; meter level

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RV201, 251	1-226-229-00	(D) 100 k/100 k, variable; MIXING
RV202, 252	1-226-247-00	(C) 250 k (special W), variable; TREBLE
RV203	1-226-227-00	(C) 250 k, variable; BALANCE
RV204, 254	1-226-231-00	(C) 100 k (C)/100 k(C), variable; BASS
RV205, 255	1-226-228-00	(D) 250 k/250 k, variable; VOLUME
RV301	1-226-230-00	(B) 50 k, variable; REVERB










SWITCHES


S1	1-552-418-00 (C) Pushbutton, FUNCTION
S2, 3	1-552-558-00 (C) Pushbutton, MUTING, LOUDNESS
S4	1-552-557-00 (D) Pushbutton, SPEAKERS
S5	 1-552-530-00 Pushbutton, POWER (Canadian model)
S5	 1-552-531-00 (C) Pushbutton, POWER (AEP, UK, E model)

JACKS

J101, 151	1-507-580-00 (B) Phono, 4-p; REC OUT1/TAPE1
J103, 153	
J102, 152	
J104, 154	1-507-581-00 (C) Phono, 6-p; AUX/TUNER/PHONO
J105, 155	
J301	1-507-589-00 (C) MIC
J302, 303	1-507-561-00 (C) TAPE 2, REC OUT 2
J304	1-507-561-00 (C) HEADPHONES

MISCELLANEOUS

CB501	 1-532-488-00 Circuit breaker (Canadian model)
CB501	 1-532-534-00 (C) Circuit breaker (AEP, E model)
CB502	 1-532-534-00 (C) Circuit breaker (AEP, UK, E model)
CNJ501	 1-526-574-13 Socket, AC OUTLET (Canadian model)
CNP501	 1-534-487-XX Cord, power; parallel-blade plug (E2 model)
CNP501	 1-551-530-00 Cord, power; euro-plug (E1 model)
CNP501	 1-534-777-00 (D) Cord, power (UK model)
CNP501	 1-534-817-XX (D) Cord, power (AEP model)
CNP501	 1-534-986-XX Cord, power (Canadian model)

Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (A to Z) are applicable to European models only.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
CP501	⚠ 1-108-750-12	ⓑ Capacitor, mylar; 0.033 μ F/300 V (AEP, UK, E model)
CP501	⚠ 1-231-341-21	Encapsulated Component (Canadian model)
CP502	1-102-335-00	ⓑ Capacitor, ceramic; 0.01 μ F/500 V x 2
ME1, 2	1-520-340-00	Ⓛ Meter, power
PL1	1-518-297-00	Ⓒ Lamp, 8 V 300 mA; meter
PL2-6	1-518-322-00	ⓑ Lamp, 4.5 V 40 mA; FUNCTION
PL7	1-518-169-XX	ⓑ Lamp, 4.5 V 40 mA; MUTING
PT501	⚠ 1-442-996-00	Transformer, power (Canadian model)
PT501	⚠ 1-446-123-11	Ⓒ Transformer, power (AEP model)
PT501	⚠ 1-446-123-21	Transformer, power (E model)
PT501	⚠ 1-446-147-00	Ⓒ Transformer, power (UK model)
RY1	⚠ 1-515-303-00	Ⓕ Relay
RU1	1-464-080-00	Ⓖ Reverbration Unit
TM1, 2	1-536-524-00	Ⓒ Terminal, 4-p; SPEAKER A/B
	⚠ 1-508-897-00	Plug, voltage selector (E model)
	⚠ 1-509-558-00	Ⓓ Housing, voltage selector (AEP model)
	⚠ 1-535-137-00	Ⓐ Base Post, voltage selector (AEP model)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

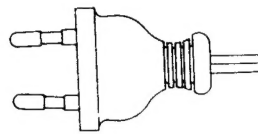
ACCESSORIES & PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
3-701-630-00	Ⓐ Bag, protection
3-770-553-11	Ⓓ Manual, instruction
4-855-829-00	ⓑ Cushion
4-855-908-00	Ⓓ Carton

— Power Cord —

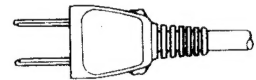
E1 model: euro-plug

(1-551-530-00)



E2 model: parallel-blade plug

(1-534-487-XX)



Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

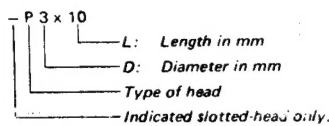
1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18k	1-244-703-11	180k	1-244-727-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244-681-11	22k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644-11	620	1-244-668-11	6.2k	1-244-692-11	62k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91k	1-244-720-11	910k	1-244-744-11		

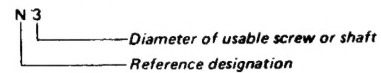
HARDWARE NOMENCLATURE

Screw:



Unless otherwise indicated, it means cross-recessed head (Phillips type).

Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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